1 QUINN EMANUEL URQUHART & SULLIVAN, LLP
   Sean Pak (Bar No. 219032)
2 seanpak@quinnemanuel.com
   Adam Wolfson (Bar No. 262125)
3 adamwolfson@quinnemanuel.com
   Andrew M. Holmes (Bar No. 260475)
4 drewholmes@quinnemanuel.com
5 50 California Street, 22nd Floor
   San Francisco, California 94111-4788
6 Telephone: (415) 875-6600
   Facsimile: (415) 875-6700
7

8 *Attorneys for AliveCor, Inc.*

9

10   UNITED STATES DISTRICT COURT

11   NORTHERN DISTRICT OF CALIFORNIA

12

13 AliveCor, Inc.,   CASE NO. 4:21-cv-03958-JSW

14   Plaintiff,   **PLAINTIFF ALIVECOR, INC.'S
                                            OPPOSITION TO DEFENDANT APPLE
15   vs.   INC.'S *DAUBERT* MOTION TO
                                            EXCLUDE THE TESTIMONY
16 Apple Inc.,   DR. ROOZBEH JAFARI**

17   Defendant.   Date: October 6, 2023
                                            Time: 9 am
18   Place: Courtroom 5, 2nd Floor

19   The Honorable Jeffrey S. White

20

21

22

23

24

25

26

27

28

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Page

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

███████████

Abbreviation Index	
Abbreviations	**Document**
AliveCor	AliveCor, Inc.
Apple	Apple Inc.
Butler Mot.	AliveCor's Motion to Strike and Exclude Portions of Report and Testimony of Sarah Butler (Dkt. 192-3)
Butler Opp.	Apple's Opposition to AliveCor's Motion to Strike and Exclude Portions of Report and Testimony of Sarah Butler (Dkt. 213-3)
Cragg Mot.	Apple's Daubert Motion to Exclude Testimony of Dr. Michael I. Cragg (Dkt. 216-3)
Cross-Mot.	Apple's Combined Cross-Motion for Summary Judgment and Opposition to AliveCor's Motion for Partial Summary Judgment (Dkt. 220-3)
Cross-Opp.	Plaintiff AliveCor, Inc's Combined Reply in Further Support of Its Motion for Partial Summary Judgment and Opposition to Apple Inc.'s Cross-Motion for Summary Judgment
HRNN	Apple's Heart Rate Neural Network
HRPO	Apple's Heart Rate Path Optimizer
IRN	Apple's Irregular Rhythm Notification Feature
Jafari Mot.	Apple's Daubert Motion to Exclude Testimony of Dr. Roozbeh Jafari (Dkt. 212-3)
Mot.	AliveCor's Partial Motion For Summary Judgment (Dkt. 193-3)
Stiroh Mot.	AliveCor's Motion to Exclude Certain Opinions and Testimony of Lauren J Stiroh (Dkt. 191-3)
Stiroh Opp.	Apple's Opposition to AliveCor's Motion to Exclude Certain Opinions and Testimony of Lauren J Stiroh (Dkt. 218-3)
Waydo Mot.	AliveCor's Brief in Support of its Motion to Strike Paragraphs 40-50 of the Declaration of Dr. Stephen Waydo

Previously Filed Document Index	
Dkt. No.	**Document**
191	AliveCor's Admin Motion to Seal Motion to Exclude Certain Opinions and Testimony of Lauren Stiroh
191-1	Decl. of N. Siebert ISO AliveCor's Admin Motion to Seal Stiroh Daubert Motion
191-2	[Proposed] Order to Seal Stiroh Daubert Motion
191-3	AliveCor's Motion to Exclude Certain Opinions and Testimony of Lauren Stiroh
191-4	Decl. of N. Siebert ISO AliveCor's Motion to Exclude Certain Opinions and Testimony of Lauren Stiroh
191-5	[Proposed] Order granting AliveCor's Motion to Exclude Certain Opinions and Testimony of Lauren Stiroh
191-6	Siebert Exhibit 1 (O'Reilly Dep. Ex. 37)

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

███████████

Previously Filed Document Index	
Dkt. No.	Document
191-7	Siebert Exhibit 2 (Cha Dep. Ex. 108)
191-8	Siebert Exhibit 3 (Cha Dep. Ex. 110)
191-9	Siebert Exhibit 4 (Cha Dep. Ex. 112)
191-10	Siebert Exhibit 5 (Waydo Dep. Ex. 101)
191-11	Siebert Exhibit 6 (Cha Dep. Ex. 109)
191-12	Siebert Exhibit 7 (Tan Dep. Ex. 15)
191-13	Siebert Exhibit 8 (Antitrust and Innovation: Welcoming and Protecting Disruption article)
191-14	Siebert Exhibit 9 (Proving Causation in Damages Analyses article)
191-15	Siebert Exhibit 10 (Stiroh Opening Report)
191-16	Siebert Exhibit 11 (Stiroh Rebuttal Report)
191-17	Siebert Exhibit 12 (Cragg Opening Report)
191-18	Siebert Exhibit 13 (Cragg Rebuttal Report)
191-19	Siebert Exhibit 14 (Jafari Corrected Opening Report)
191-20	Siebert Exhibit 15 (Stiroh May 18 Depo Transcript)
191-21	Siebert Exhibit 16 (Stiroh June 14 Depo Transcript)
191-22	Siebert Exhibit 17 (Cragg May 17 Depo Transcript)
191-23	Siebert Exhibit 18 (Cragg June 20 Depo Transcript)
191-24	Siebert Exhibit 19 (Cha Depo Transcript)
191-25	Siebert Exhibit 20 (Tan Depo Transcript)
191-26	Siebert Exhibit 21 (Stiroh June 14 Dep. Ex. 3)
192	AliveCor's Admin Motion to Seal Motion to Strike and Exclude Report & Testimony of Sarah Butler
192-1	Decl. of K. Shah ISO AliveCor's Admin Motion to Seal Butler Daubert Motion
192-2	[Proposed] Order to Seal Butler Daubert Motion
192-3	AliveCor's Motion to Strike and Exclude Report & Testimony of Sarah Butler
192-4	Decl. of K. Shah ISO AliveCor's MTS Exclude Report & Testimony of Sarah Butler
192-5	[Proposed] Order AliveCor's Motion to Strike and Exclude Report & Testimony of Sarah Butler
192-6	Shah Exhibit 1 (Cragg Opening Report)
192-7	Shah Exhibit 2 (Diehl Opening Report)

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

████████████

Previously Filed Document Index	
Dkt. No.	**Document**
192-8	Shah Exhibit 3 (Butler Opening Report)
192-9	Shah Exhibit 4 (Butler Depo Transcript)
192-10	Shah Exhibit 5 (Serwin Rebuttal Report)
192-11	Shah Exhibit 6 (Stiroh June 14 Depo Transcript)
193	AliveCor's Admin Motion to Seal Motion for Partial Summary Judgment
193-1	Decl. of A. Wolfson ISO AliveCor's Admin Motion to Seal AliveCor's Partial Summary Judgment Motion
193-2	[Proposed] Order granting Seal AliveCor's Partial Summary Judgment Motion
193-3	AliveCor's Motion for Partial Summary Judgment
193-4	Decl. of A. Wolfson ISO AliveCor's Motion for Partial Summary Judgment
193-5	[Proposed] Order granting AliveCor's Motion for Partial Summary Judgment
193-6	Wolfson Exhibit 1 (Tan Dep. Ex. 3)
193-7	Wolfson Exhibit 2 (Tan Dep. Ex. 5)
193-8	Wolfson Exhibit 3 (Tan Dep. Ex. 6)
193-9	Wolfson Exhibit 4 (Tan Dep. Ex. 9)
193-10	Wolfson Exhibit 5 (Tan Dep. Ex. 10)
193-11	Wolfson Exhibit 6 (Tan Dep. Ex. 15)
193-12	Wolfson Exhibit 7 (O'Reilly Dep. Ex. 37)
193-13	Wolfson Exhibit 8 (O'Reilly Dep. Ex. 45)
193-14	Wolfson Exhibit 9 (Waydo Dep. Ex. 93)
193-15	Wolfson Exhibit 10 (Valys Dep. Ex. 2)
193-16	Wolfson Exhibit 11 (Waydo Dep. Ex. 99)
193-17	Wolfson Exhibit 12 (Waydo Dep. Ex. 100)
193-18	Wolfson Exhibit 13 (Waydo Dep. Ex. 101)
193-19	Wolfson Exhibit 14 (Cha Dep. Ex. 104)
193-20	Wolfson Exhibit 15 (Cha Dep. Ex. 105)
193-21	Wolfson Exhibit 16 (Cha Dep. Ex. 107)
193-22	Wolfson Exhibit 17 (Cha Dep. Ex. 108)
193-23	Wolfson Exhibit 18 (Cha Dep. Ex. 109)
193-24	Wolfson Exhibit 19 (Cha Dep. Ex. 110)
193-25	Wolfson Exhibit 20 (Cha Dep. Ex. 111)

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

Previously Filed Document Index	
Dkt. No.	**Document**
193-26	Wolfson Exhibit 21 (Cha Dep. Ex. 112)
193-27	Wolfson Exhibit 22 (APL-ALVCOR_00351927)
193-28	Wolfson Exhibit 23 (Valys Dep. Ex. 9)
193-29	Wolfson Exhibit 24 (AliveNDCal_05514272)
193-30	Wolfson Exhibit 25 (Stiroh Dep. Ex. 2)
193-31	Wolfson Exhibit 26 (Stiroh Opening Report)
193-32	Wolfson Exhibit 27 (Stultz Corrected Opening Report)
193-33	Wolfson Exhibit 28 (Tan Depo Transcript)
193-34	Wolfson Exhibit 29 (Waydo Depo Transcript)
193-35	Wolfson Exhibit 30 (Shapiro Depo Transcript)
193-36	Wolfson Exhibit 31 (Cha Depo Transcript)
193-37	Wolfson Exhibit 32 (O'Reilly Depo Transcript)
193-38	Wolfson Exhibit 33 (Stultz 5/11 Depo Transcript)
193-39	Wolfson Exhibit 34 (Stultz 6/22 Depo Transcript)
193-40	Wolfson Exhibit 35 (Stiroh May 18 Depo Transcript)
193-41	Wolfson Exhibit 36 (Stiroh June 14 Depo Transcript)
193-42	Wolfson Exhibit 37 (Cragg Opening Report)
193-43	Wolfson Exhibit 38 (Austin Smith Opening Report)
193-44	Wolfson Exhibit 39 (Jafari Corrected Opening Report)
193-45	Wolfson Exhibit 40 (Jafari Rebuttal Report)
193-46	Wolfson Exhibit 41 (Valys Depo Transcript)
193-47	Wolfson Exhibit 42 (Gundotra Depo Transcript)
193-48	Wolfson Exhibit 43 (Lopez Depo Transcript)
193-49	Wolfson Exhibit 44 (Petterson Depo Transcript)
193-50	Wolfson Exhibit 45 (Economics of Antitrust Complex Issues in a Dynamic Economy)
212	Apple's Admin Motion to Seal Daubert Motion to Exclude Testimony of R. Jafari
212-1	Decl. of C. Higney ISO Apple's Admin Motion to Seal Jafari Daubert Motion
212-2	[Proposed] Order granting Motion to Seal Jafari Daubert Motion
212-3	Motion to Exclude Dr. Roozbeh Jafari
212-4	[Proposed] Order Granting Apple Motion to Exclude Dr. Jafari

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

Previously Filed Document Index	
Dkt. No.	**Document**
213	Apple's Admin Motion to Seal Opp. to AliveCor's Motion to Strike & Exclude Testimony of S. Butler
213-1	Decl. of J. Lo ISO Apple's Admin Motion to Seal Its Opposition to Butler Daubert Motion
213-2	[Proposed] Order granting Motion to Seal Its Opposition to Butler Daubert Motion
213-3	Opposition to AliveCor's Motion to Strike Butler
213-4	[Proposed] Order Denying Motion to Exclude Butler
214	Apple's Notice of Daubert Motion to Exclude Testimony of R. Jafari
214-1	Apple's Daubert Motion to Exclude Testimony of R. Jafari
215	Apple's Opposition to AliveCor's Motion to Strike & Exclude Testimony of S. Butler
216	Apple's Admin Motion to Seal Daubert Motion to Exclude Testimony of M. Cragg
216-1	Decl. of C. Higney ISO Apple's Admin Motion to Seal Cragg Daubert Motion
216-2	[Proposed] Order granting Motion to Seal Cragg Daubert Motion
216-3	Apple's Motion to Exclude Dr Cragg
216-4	[Proposed] Order Granting the Motion to Exclude Dr. Cragg
217	Apple's Notice of Daubert Motion to Exclude Testimony of M. Cragg
217-1	Apple's Daubert Motion to Exclude Testimony of M. Cragg
218	Apple's Admin Motion to Seal Opp. to AliveCor's Motion to Exclude Testimony of L. Stiroh
218-1	Decl. of J. Lo Higney ISO Apple's Admin Motion to Seal Its Opposition to Stiroh Daubert Motion
218-2	[Proposed] Order granting Motion to Seal Its Opposition to Stiroh Daubert Motion
218-3	Apple's Opposition to AliveCor's Motion to Exclude Testimony of L. Stiroh
218-4	[Proposed] Order Denying Motion to Exclude Stiroh
219	Apple's Opposition to AliveCor's Motion to Exclude Testimony of L. Stiroh
220	Apple's Admin Motion to Seal Cross-MSJ & Opp. to AliveCor's Partial MSJ
220-1	Decl. of C. Higney ISO Apple's Admin Motion to Seal Apple Cross-Mot. Summary Judgment
220-2	[Proposed] Order granting Motion to Seal Apple Cross-Mot. Summary Judgment
220-3	Apple Cross-Mot. Summary Judgment
220-4	[Proposed] Order Granting Apple MSJ & Denying AliveCor MSJ

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

Previously Filed Document Index	
Dkt. No.	**Document**
220-5	Decl. of Stephen Waydo
220-6	Waydo Exhibit A (Apple Unveils Apple Watch-Apple's Most Personal Device Ever)
220-7	Waydo Exhibit B (Apple Watch Available in Nine Countries on April 24)
220-8	Waydo Exhibit C (Use the Workout app on your Apple Watch)
220-9	Waydo Exhibit D (Monitor your heart rate with Apple Watch)
220-10	Waydo Exhibit E (APL-ALVCOR_00796638)
220-11	Waydo Exhibit F (APL-ALVCOR_00611807)
220-12	Waydo Exhibit G (APL-ALVCOR_00610371)
220-13	Waydo Exhibit H (APL-ALVCOR_00860277)
220-14	Waydo Exhibit I (APL-ALVCOR_00831965)
220-15	Waydo Exhibit J (HKWorkout _ Apple Developer Documentation)
220-16	Waydo Exhibit K (HKWorkoutSession_ Apple Developer Documentation)
220-17	Waydo Exhibit L (Adding samples to a workout _ Apple Developer Documentation)
220-18	Waydo Exhibit M (watchOS 4 brings more intelligence and fitness features to Apple Watch)
220-19	Waydo Exhibit N (watchOS 5 adds powerful activity and communications features to Apple Watch)
220-20	Waydo Exhibit O (watchOS 8 brings new access, connectivity, and mindfulness features to Apple Watch)
220-21	Waydo Exhibit P (watchOS 9 delivers new ways to stay connected, active, and healthy)
220-22	Waydo Exhibit Q (watchOS 10 Preview)
221	Apple's Notice of Cross-MSJ
221-1	Apple's Cross-MSJ & Opp. to AliveCor's Partial MSJ
222	Apple's Admin Motion to Seal Decl. of J. Lo ISO Apple's MSJ & Daubert Motions
222	Lo Decl ISO Apple's MSJ and Daubert Filings
222-1	Decl. of J. Lo ISO Motion to Seal Lo Decl ISO Apple's MSJ and Daubert Filings
222-2	[Proposed] Order granting Motion to Seal Lo Decl ISO Apple's MSJ and Daubert Filings
222-3	Decl. of Jason Lo ISO MSJ and Daubert Briefs
222-4	Lo Exhibit 1 (Stiroh Opening Report)
222-5	Lo Exhibit 2 (Stultz Rebuttal Report)

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

Previously Filed Document Index	
Dkt. No.	**Document**
222-6	Lo Exhibit 3 (Apple Watch Available in Nine Countries on April 24)
222-7	Lo Exhibit 4 (Apple Unveils Apple Watch—Apple's Most Personal Device Ever)
222-8	Lo Exhibit 5 (Cragg Opening Report)
222-9	Lo Exhibit 6 (Stultz Corrected Opening Report)
222-10	Lo Exhibit 7 (Jafari Corrected Opening Report)
222-11	Lo Exhibit 8 (Williams Depo Transcript)
222-12	Lo Exhibit 9 (Stiroh Rebuttal Report)
222-13	Lo Exhibit 10 (Monitor your heart rate with Apple Watch)
222-14	Lo Exhibit 11 (APL-ALVCOR_00796638)
222-15	Lo Exhibit 12 (Shapiro Depo Transcript)
222-16	Lo Exhibit 13 (APL-ALVCOR_00611807)
222-17	Lo Exhibit 14 (APL-ALVCOR_00860277)
222-18	Lo Exhibit 15 (APL-ALVCOR_00610371)
222-19	Lo Exhibit 16 (Waydo Depo Transcript)
222-20	Lo Exhibit 17 (APL-ALVCOR_01019397)
222-21	Lo Exhibit 18 (APL-ALVCOR_01019113)
222-22	Lo Exhibit 19 (Apple Developer Program License Agreement)
222-23	Lo Exhibit 20 (Locke Depo Transcript)
222-24	Lo Exhibit 21 (APL-ALVCOR_00000179)
222-25	Lo Exhibit 22 (Gundotra Depo Transcript)
222-26	Lo Exhibit 23 (APL-ALVCOR_00078193)
222-27	Lo Exhibit 24 (Caldbeck Depo Transcript)
222-28	Lo Exhibit 25 (User Manual for Kardia by AliveCor and OmronConnect)
222-29	Lo Exhibit 26 (APL-ALVCOR_00436336)
222-30	Lo Exhibit 27 (APL-ALVCOR_00079528)
222-31	Lo Exhibit 28 (AliveNDCal_01511763)
222-32	Lo Exhibit 29 (AliveNDCal_01511764)
222-33	Lo Exhibit 30 (AliveNDCal_04638165)
222-34	Lo Exhibit 31 (AliveNDCal_04638166)
222-35	Lo Exhibit 32 (AliveNDCal_04649133)
222-36	Lo Exhibit 33 (AliveNDCal_04649134)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

Previously Filed Document Index	
Dkt. No.	**Document**
222-37	Lo Exhibit 34 (Cragg May 17 Depo Transcript)
222-38	Lo Exhibit 35 (Cragg June 20 Depo Transcript)
222-39	Lo Exhibit 36 (HKWorkout _ Apple Developer Documentation)
222-40	Lo Exhibit 37 (Running workout sessions _ Apple Developer Documentation)
222-41	Lo Exhibit 38 (APL-ALVCOR_00605882)
222-42	Lo Exhibit 39 (Foley Opening Report)
222-43	Lo Exhibit 40 (Cragg Rebuttal Report)
222-44	Lo Exhibit 41 (APL-ALVCOR_00442146)
222-45	Lo Exhibit 42 (AliveNDCal_00011693)
222-46	Lo Exhibit 43 (Tan Depo Transcript)
222-47	Lo Exhibit 44 (Barnett Depo Transcript)
222-48	Lo Exhibit 45 (Valys Depo Transcript)
222-49	Lo Exhibit 46 (Stultz Depo Transcript)
222-50	Lo Exhibit 47 (Cha Depo Transcript)
222-51	Lo Exhibit 48 (APL-ALVCOR_00066223)
222-52	Lo Exhibit 49 (Stultz Depo Transcript)
222-53	Lo Exhibit 50 (Austin Smith Opening Report)
222-54	Lo Exhibit 51 (AliveNDCal_00022918)
222-55	Lo Exhibit 52 (Jafari 5/19 Depo Transcript)
222-56	Lo Exhibit 53 (Jafari 6/19 Depo Transcript)
222-57	Lo Exhibit 54 (APL_ALVCOR_00823192)
222-58	Lo Exhibit 55 (Butler Rebuttal Report)
222-59	Lo Exhibit 56 (Diehl Opening Report)
222-60	Lo Exhibit 57 (Butler Depo Transcript)
222-61	Lo Exhibit 58 (Diehl Depo Transcript)
222-62	Lo Exhibit 59 (Stiroh 5/18 Depo Transcript)
222-63	Lo Exhibit 60 (Stiroh 6/14 Depo Transcript)
222-64	Lo Exhibit 61 (Jafari Rebuttal Report)
222-65	Lo Exhibit 62 (APL_ALVCOR_00078272)
222-66	Lo Exhibit 63 (APL_ALVCOR_00078391)
222-67	Lo Exhibit 64 (Apple Watch User Guide, WatchOS 9.4)

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

Previously Filed Document Index	
Dkt. No.	**Document**
222-68	Lo Exhibit 65 (View Heart Rate Zones on Apple Watch - Apple Support)

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

I.   PRELIMINARY STATEMENT

Dr. Roozbeh Jafari is an expert in biomedical, computer science, and electrical engineering. Apple does not dispute that he possesses the qualifications and experience needed to render opinions on how Apple's heart algorithms work, how they changed between versions of watchOS, and how those changes affected AliveCor's watchOS heart rhythm analysis app ("HRA"), SmartRhythm. Apple does not contest that Dr. Jafari extensively reviewed Apple's source code for the opinions he provides, nor that he designed and then oversaw experiments to confirm his source-code based understandings of how gating off HRPO to third parties rendered SmartRhythm and other similar types of HRA apps effectively useless. Moreover, Apple does not contend that Dr. Jafari's experimental methods and results violate well-accepted scientific practice and standards.

Instead, Apple seeks to exclude Dr. Jafari by mischaracterizing what his experiments were intended to show and the bases for his ultimate conclusions in his opening report. Apple does so because its own technical expert, Dr. Collin Stultz, failed to provide any rebuttal experimental data with regards to SmartRhythm's performance, thus putting Apple at a disadvantage on the technical side of this case. But misconstruing Dr. Jafari's opinions in their entirety and trying to recast his experiments as something they are not is not a legitimate basis for exclusion.

In its motion, for example, Apple claims Dr. Jafari had to conduct an experiment using a "large and representative portion of the AliveCor userbase or general population" in order to offer any opinions about whether watchOS 5 negatively affected competing HRA apps. Jafari Mot. at 1. However, as Dr. Jafari explained, his experiments were narrow in scope; they were meant to confirm his understanding of *how* the switch from HRPO to HRNN obscured irregular heart rates and *why* that would create fundamental problems for SmartRhythm. Apple cannot identify a single reason why narrow experiments with such a narrow scope would need to instead be the equivalent of a clinical validation study. Moreover, *AliveCor* conducted the much broader analysis of SmartRhythm's effectiveness that Apple (incorrectly) contends was necessary. Accordingly, the evidence the jury will hear about an analysis of a "large and representative portion of the AliveCor user base" will come from AliveCor itself.

Apple next challenges Dr. Jafari's methodology as supposedly "cherry-picking" data. But

1   this again misconstrues the purpose of Dr. Jafari's experiments, including why he selected the data

2   he used. As noted, Dr. Jafari's experiments were intended to confirm his suspicions, based on his

3   extensive review of Apple's source code, that the changes implemented in watchOS 5 would

4   degrade SmartRhythm's performance in specific ways. He selected the same data SmartRhythm's

5   creator (former AliveCor employee, Alex Valys) used when AliveCor first determined that

6   watchOS 5 had crippled SmartRhythm, because (a) that data included known examples of Afib that

7   should have triggered SmartRhythm if it were working correctly, and (b) the results of that testing

8   were documented in a 2018 memorandum regarding a version of SmartRhythm that AliveCor

9   trained purely on HRPO-generated heart rates. Apple contends in this case that AliveCor could have

10 just "retrained" SmartRhythm to work using HRNN heart rates, but the version Dr. Jafari used *was*

11 AliveCor's best effort at retraining SmartRhythm and his experiments showed it *still* did not work.

12 This is why, as Apple repeats throughout its brief, Dr. Jafari's experiments produced a different

13 result than Mr. Valys's 2018 testing with respect to one sample. But it also confirms Dr. Jafari's

14 source code-based suspicion, which is that watchOS 5's algorithm change broke SmartRhythm.

15 Thus, far from "cherry picking," this is an example of good science; specifically, repeating an

16 experiment while changing only one variable (the version of SmartRhythm) to see if anything

17 changes. To the extent Apple wants to challenge this experimental choice at trial, it can; but it

18 identifies no methodological flaws given the targeted nature of the experiment in question.

19   Finally, Apple faults Dr. Jafari for purportedly failing to conduct an independent analysis of

20 other materials he relied on, including extensive testimony from AliveCor's witnesses and

21 contemporaneous documents showing that the percentage of SmartRhythm alerts significantly

22 declined between watchOS 4 and watchOS 5. Apple's arguments fail because Dr. Jafari *did* conduct

23 an independent investigation to test these statements, including through his completely unchallenged

24 source code analysis and through his further Apple Watch sample experiments.

25   Dr. Jafari is more than qualified and his methodology more than satisfies *Daubert*—indeed,

26 it is far beyond anything Apple's own technical expert did. The Court should deny Apple's motion

27 to exclude Dr. Jafari's opinion that watchOS 5 degraded SmartRhythm's performance.

28

██████████████

II.   BACKGROUND

Dr. Jafari relied on three categories of data to form his opinion that watchOS 5 degraded SmartRhythm's functionality: (1) documents and testimony from AliveCor, (2) experiments conducted on physical Apple Watch samples that were loaded with historical versions of watchOS, and (3) Apple's source code. Apple ignores this third category entirely. Jafari Mot. at 3-5.

A.   AliveCor's Contemporaneous Documents Observing That Apple Crippled HRA App Competition

In 2018, Mr. Valys (SmartRhythm's creator), noticed in a beta release of watchOS 5 that something had changed in how Workout Mode reported heart rates, and that it affected SmartRhythm's functionality. He therefore ████████████████████████████

██

██

██

██

██████████████ ████████████████████████████████████

██

████████████ ██

██████████ ████████████████████████████ Mr. Valys attempted to fix the issue. He did so by 'retraining' SmartRhythm's machine learning algorithm on watchOS 5 heart rates, to try to mitigate the damage; AliveCor then released that version of SmartRhythm in October 2018. Dkt. 193-46 at 146:20-147:6; Dkt. 193-29 (Kardia Change log).

Those efforts, however, were to no avail. In January 2019, after reviewing thousands of real world SmartRhythm user data points, Mr. Valys reported the retrained software issued alerts three times ████████████████████████████ Dkt. 193-28; *see also* Dkt. 193-46 at 282:2-12; Dkt. 193-48 at 52:18-53:12, 54:15-55:6, 69:3-18.

B.   Dr. Jafari's Source Code Review And 2023 Watch Sample Experiments

To investigate what changed in watchOS 5 and why that might affect SmartRhythm, Dr. Jafari first extensively reviewed Apple's source code. Dkt. 222-56 at 160:9-161:8; Dkt. 222-10

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

██████████████████

1 ¶ 90. Relying on that code, he formed his initial hypothesis that the changes Apple implemented in

2 watchOS 5 would have necessarily degraded SmartRhythm's performance, Dkt. 222-56 at

3 160:9-161:8; *see also* Dkt. 193-44 ¶ 90.

4   As Dr. Jafari testified, however, source code review could only get him so far. Dkt. 222-56

5 at 162:4-16. The format in which Apple made its source code available did not permit Dr. Jafari to

6 analyze how the watchOS 5 algorithms running on a physical Apple Watch would affect the heart

7 rate samples made available in Workout Mode; nor would it allow him to see how those algorithms

8 might affect SmartRhythm's performance. *Id.* Dr. Jafari therefore designed a set of experiments to

9 test SmartRhythm specifically, but also heart rate reporting more generally, using Apple Watches

10 loaded with historical versions of watchOS 4 and 5. Dkt. 193-44 ¶ 82.

11   As part of designing his SmartRhythm-focused experiments, Dr. Jafari used the 2018 Valys

12 memorandum as a guide. While Apple argues that ██████████████████████████████

13 ████████████████████████ thus, Dr. Jafari used those ████████████ for repeatability

14 purposes. Also, ████████████████████████████████████, whereas Dr. Jafari used the

15 version of SmartRhythm that Mr. Valys retrained after discovering the degrading effects of

16 watchOS 5. Dkt. 222-10 ¶ 82. It was this retrained version of SmartRhythm that AliveCor ultimately

17 released to the public, and therefore the one Dr. Jafari used to test watchOS 5's degrading effects.

18   In Dr. Jafari's SmartRhythm experiments, the first dataset produced an alert on both

19 watchOS 4 and watchOS 5, which Apple claims was a "contrapositive outcome." But Dr. Jafari

20 explained this was likely because Mr. Valys retrained SmartRhythm in an attempt to mitigate the

21 degrading effects of watchOS 5, among other reasons. Dkt. 193-44 ¶ 83; Dkt. 222-56 at 92:22-93:20

22 (watchOS 5 produced a ████████████████████ As Mr. Valys himself explained in

23 contemporaneous documents, ██

24 ██ Dkt. 193-28;

25 *see also* Dkt. 1 ¶ 85. The second dataset produced similar results as in 2018, even with the retrained

26 SmartRhythm: an alert on watchOS 4, but not on watchOS 5. Dkt. 193-44 ¶ 86. This demonstrated

27 the impact of the reduced heart rate variability in watchOS 5 on SmartRhythm's performance,

28 *despite* AliveCor's efforts to mitigate the damage to its algorithm. *Id.*

1   Dr. Jafari also conducted an additional set of experiments that more broadly compared the

2   performance of watchOS 4 and watchOS 5 in calculating heart rates without regard to the impact

3   on SmartRhythm's performance. Dkt. 193-44 ¶¶ 87-89. In addition to testing whether and when

4   SmartRhythm would issue an alert on watchOS 4 and watchOS 5, Dr. Jafari sought to analyze the

5   degree to which watchOS 4 and watchOS 5 could accurately capture heart rate variability (a key

6   metric for identifying Afib) against a baseline "reference heart rate," which could be performed by

7   comparing heart rates reported in each of the respective operating systems against the heart rates

8   contemporaneously recorded by a "gold-standard" ECG sensor. *Id*. Based on these experiments,

9   Dr. Jafari found that watchOS 4 "more accurately captured heart rate variability" than watchOS 5.

10 *Id*. ¶ 87. He concluded that the change Apple implemented in watchOS 5 "likely severely reduced

11 SmartRhythm's functionality, particularly in situations where the user was experiencing a hallmark

12 arrhythmia like Afib, causing SmartRhythm to not issue a 'take ECG' alert to the user." *Id*. ¶ 89.

13   Finally, Dr. Jafari independently evaluated the heart rate samples produced by watchOS 4

14 and watchOS 5 against those documented in the 2018 Valys memorandum. Dkt. 222-55 at 22:15-20.

15 ██████████████████████████████████████

16 ████████████████████████

17 **III.   LEGAL STANDARD**

18   Expert testimony must be both reliable and relevant, meaning that it "fits" the issues in the

19 case. *Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311, 1315 (9th Cir. 1995). Provided that an

20 expert's testimony neither purely speculative, *see Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S.

21 579, 590 (1993), nor legally infirm, *see United Food & Com. Workers Loc. 1776 & Participating*

22 *Emps. Health & Welfare Fund v. Teikoku Pharma USA*, 296 F. Supp. 3d 1142, 1183 (N.D. Cal.

23 2017), questions regarding what data, documents, or topics analyzed or not analyzed by an expert

24 go to weight, not admissibility. *In re Apple iPod iTunes Antitrust Litig.*, 2014 WL 4809288, at *5

25 (N.D. Cal. Sept. 26, 2014) ("The Court has weighed Apple's objections carefully and finds that none

26 establish such a level of unreliability or unhelpfulness that would justify wholesale exclusion of

27 Noll's opinions. Rather, they go to the weight of Noll's opinions.").

28

IV.   ARGUMENT

A.   Apple Mischaracterizes The Intended Purpose And Scope of Dr. Jafari's Experiments

1.   Dr. Jafari's test cases use sound methods to demonstrate how watchOS 5's algorithm change degraded HRA apps

Apple's first major argument is that Dr. Jafari supposedly had to show that SmartRhythm accurately detected Afib and other heart conditions on watchOS 4 before he could show that watchOS 5 degraded its performance. In essence, Apple argues that Dr. Jafari had to first clinically validate SmartRhythm, including by assembling the large patient populations and making the major investments that such validations entail. But, someone already did that clinical validation—AliveCor—and that evidence will be presented to the jury at trial. *See* Lee Ex. 1 at '858.[1] Apple thus erects a strawman from the get go; Dr. Jafari has consistently explained that his experiments tested the nature of the algorithm change's effects on SmartRhythm, rather than whether SmartRhythm was clinically validated. Dkt. 193-44 ¶¶ 64-65.

At deposition, Apple questioned Dr. Jafari about statistical significance. He explained that proving an algorithm works generally does require a showing of statistical significance. But, he also explained his experiments focused on *how* SmartRhythm's functioning changed from watchOS 4 to watchOS 5; not how well it worked in the first place. Dkt. 222-56 at 160:9-161:8. While Dr. Stultz demands more of Dr. Jafari's experiments, *see* Dkt. 222-5 at ¶ 134, he could not identify a single reason why constructing and conducting the experiments in this way failed to test the difference in functionality pre- and post-algorithm change. *Cf. id.* (citing no basis for the purported methodological flaw). Apple cites no legal or other authority, only the say-so of its expert, for the proposition that an expert opining on whether a product's performance changed—and, if so, how—before and after a certain event (*e.g.*, the release of watchOS 5) must first show that the product was performing to certain standards in the first place.[2] With no methodological flaw at issue, it is thus

---

[1]   "Lee Ex. __" refers to the exhibits to the declaration of Bruce Lee, filed herewith.

[2]   Apple relies (Jafari Mot. at 7) on *Chen-Oster v. Goldman, Sachs & Co.*, 325 F.R.D. 55 (S.D.N.Y 2018), to argue that Dr. Jafari's opinion should be excluded for using too small of a sample size. But the rebuttal "statistical expert" there conducted matching pair analyses—a statistical test (footnote continued)

████████████

1   clear that this sort of "battle of the experts" must be resolved by a jury. *City of Pomona v. SQM*

2   *North America Corp.*, 750 F.3d 1036, 1049 (9th Cir. 2014).

3   Apple separately argues that Dr. Jafari's experiments insufficiently demonstrated that

4   SmartRhythm's functionality degraded between watchOS 4 and watchOS 5. Jafari Mot. at 7-9. But,

5   this again confuses *whether* the product was rendered commercially useless with the *mechanism* by

6   which it became useless. Dr. Jafari tested the latter. He designed the experiments to test his source

7   code-, document-, and testimony-based suspicions that the algorithm change in watchOS 5 severely

8   dampened the heart rate variability reported in Workout Mode, such that they would obscure the

9   indicia of irregular heart rhythms on which HRA apps depend. Dkt. 222-56 at 160:9-161:8.

10   Dr. Jafari's source code review revealed that, in watchOS 5, ████████████████████

11   ██

12   ████████████████████████████████ Dkt. 193-44 ¶ 90. He then conducted his

13   experiments to see whether those observed changes in ███████████████████

14   had the expected negative effects on SmartRhythm. *Id.* ¶¶ 66-67, 81-82, Appx. ¶ 2. They did. *Id.*

15   ¶¶ 81-89, Appx. A ¶¶ 18-24. Apple wholly ignores that Dr. Jafari's experiments confirmed his

16   source code analysis, and Apple provides no argument or case law suggesting that confirmatory

17   experiments are somehow improper to test source code-based hypotheses.[3] The opposite is true. *See*

18   *City of Pomona*, 750 F.3d at 1047 (experiment protocol others could follow "demonstrates that [the

19

20   used to identify potential confounding factors in a larger analysis—to argue the plaintiffs' statistical
21   models failed. *Id*. at 69-70. Matching pairs analysis is a statistical technique, and accordingly
    requires statistical significance, unlike Dr. Jafari's targeted physical experiments here. *See id*.

22   [3]   Apple's reliance (Jafari Mot. at 7) on *Rearden LLC v. Walt Disney Co.*, 2021 WL 6882227
    (N.D. Cal. Jul. 12, 2021), is misplaced. The expert there inferred causation from a statistical analysis,
23   but lacked sufficient data to make that causal leap. *Id.* at *6. Here, Dr. Jafari offers no statistical
    analyses, and instead shows through his non-statistical experiments, source code review, and the
24   documents and testimony adduced in this case, that Apple's algorithm change degraded
    SmartRhythm's performance. *Grodzitsky v. Am. Honda Motor Co.*, 957 F.3d 979 (9th Cir. 2020) is
25   inapposite because the expert there "articulated no scientific basis for his observations." *Id*. at 987.
26   Dr. Jafari, by contrast, (1) explained why Apple's algorithm change *should* cause a degradation of
    SmartRhythm's performance and (2) tested that the performance *in fact* was degraded. Dkt. 193-44
27   ¶¶ 81-90. That he relied on these non-statistical pieces of evidence to reach his conclusion is of no
    moment. *See In re High-Tech Emp. Antitrust Litig.*, 985 F. Supp. 2d 1167, 1221 (N.D. Cal. 2013)
28   (experts may permissibly rely on documentary and qualitative evidence in their causation opinions).

1   expert's] methods can be objectively challenged."); *see also Elosu v. Middlefork Ranch Inc.*, 26

2   F.4th 1017, 1028 (9th Cir. 2022) ("In performing its gatekeeping function, a district court 'is not

3   tasked with deciding whether [the challenged expert] is right or wrong, just whether his testimony

4   has substance such that it would be helpful to a jury.'").

5   Moreover, Apple does not explain why statistical sample size arguments even apply to

6   Dr. Jafari's experiments in the first place. Using highly-controlled conditions, he tested whether a

7   single software design change (the switch from HRPO to HRNN heartrates) resulted in observable

8   changes between how SmartRhythm performed on watchOS 4 and on watchOS 5. Dkt. 193-44 ¶ 82,

9   Appx. A (explaining experimental design and findings); Dkt. 222-56 at 164:1-21. Apple identifies

10   no case law or other authority indicating that, if there is no reason to doubt experiment results'

11   validity (which Apple does not try to do anywhere in its brief), then an expert should be excluded

12   simply because their opponent thinks they should have done *more* experiments.[4]

13   In discussing the infirmities with Apple's sample size-based criticisms, it is particularly

14   notable that *Apple* did not conduct any of its own experiments—presumably because it knows they

15   would all show the exact same degradation in SmartRhythm's performance.[5] Apple cannot seek to

16   exclude Dr. Jafari's experiments on the basis of sample size when it literally has no evidence that

17   expanding the number of samples would show different results or suggest that Dr. Jafari's results

18   were abnormal. And, once again invoking the elephant in the room, *AliveCor* conducted

19   extraordinarily broad analyses in the ordinary course of business showing widespread degradation

20

---

21   [4]   *Sparling v. Doyle*, 2015 WL 4528759 (W.D. Tex. July 27, 2015), is inapposite. The expert in
     Sparling drew a causal inference about the drug at issue from other drugs in the same class, without

22   controlling for drug-specific characteristics. *Id*. at *19. He relied specifically on outliers to form that
     opinion. *Id*. at *21-22. Here, Dr. Jafari used SmartRhythm's actual code, as well as the actual code

23   of watchOS 4 and watchOS 5, along with his source code review, to prove that Apple's algorithm
     change degraded SmartRhythm. Dkt. 193-44 ¶¶ 81-90. Neither Apple nor Dr. Stultz provide any

24   reason why Dr. Jafari's sample patients were outliers. *Brooks v. Morphe LLC*, 2022 WL 2052680
     (E.D. Cal. June 7, 2022), is further afield. The plaintiff there offered "no statistics, expert opinion,

25   reasoning, or data," and even copied algebraic calculations from one of her prior lawsuits, which
     had nothing to do with her present case. *Id*. at *2-4. These facts bear no resemblance to Dr. Jafari's

26   carefully circumscribed analyses.
     [5]   Dr. Stultz claims that he attempted to recreate Dr. Jafari's experiments but failed to obtain the

27   same results. However, Dr. Stultz admitted he never reviewed Dr. Jafari's experiment protocol, let

28   alone tried to follow it step-by-step. Dkt. 193-39 at 127:3-16, 130:1-8.

1   in SmartRhythm's performance, which itself bolsters and demonstrates the methodological validity

2   of Dr. Jafari's approach. *See, e.g.,* Dkt. 193-28; Dkt. 193-46 at 282:2-12; Dkt. 193-48 at

3   52:18-53:12, 54:15-55:6, 69:3-18.

2.   Dr. Jafari did not cherry-pick or use "non-representative" data

(a)   *Dr. Jafari selected samples that best tested his working hypothesis*

6   Apple next contends that Dr. Jafari's methodology for his confirmatory experiments is

7   flawed for relying on two "cherry-picked" samples. Apple again misses the point of Dr. Jafari's

8   experiments. In doing so, Apple misrepresents the manner in which Dr. Jafari selected the two

9   samples, and his reasons for basing tests on those particular samples.

10   First, Apple claims that Mr. *Valys* cherry-picked the two data samples used in Dr. Jafari's

11   experiments "after seeing how they performed on similar tests." Jafari Mot. at 9. But there is no

12   indication that Mr. Valys's data selection was motivated by improper purposes. To the contrary,

13   testimony from Mr. Valys and other AliveCor employees makes clear that the memorandum was

14   prepared in the normal course of business so that AliveCor's then-CEO and other executives could

15   understand the business-crippling phenomenon Mr. Valys observed. Dkt. 193-46 at 184:17-185:15

16   (noting the two samples were ███████████████████ between watchOS 4 and

17   watchOS 5 so that he could ███████████████████ what he had observed).

18   Nor are there any such concerns with Dr. Jafari. As he explained, he focused on these two

19   data samples because they were logged in 2018. Dkt. 222-55 at 89:24-90:13; *see also id.* at

20   96:13-97:15 (testifying that, to Dr. Jafari's knowledge, AliveCor did not log or archive ████

21   ███████████████). Furthermore, Mr. Valys noted under oath that ██████

22   ████████████████████████████████ Dkt. 193-46

23   at 281:1-11. Apple *speculates* other samples *might* show something different, but that clearly fails

24   to demonstrate "cherry-picking" or a basis to exclude. *See*, *e.g.*, *Cmty. Ass'n for Restoration of the*

25   *Env't, Inc. v. Cow Palace, LLC*, 80 F. Supp. 3d 1180, 1225 (E.D. Wash. 2015) (rejecting "cherry

26   picking" allegations based on the "hypothetical musings" of defense expert).

27   Apple also ignores that Dr. Jafari cannot have known the results of his experiments based

28   on Mr. Valys' 2018 experiment, because ████████████████████

████████████████████

1   ███████████, whereas Dr. Jafari conducted his experiments using a retrained version that

2   AliveCor created to try to undo the crippling problems Apple created with its watchOS 5 algorithm

3   change. As Apple notes repeatedly throughout its Motion, Dr. Jafari's experiments returned

4   ***different*** results with respect to when and whether SmartRhythm issued an alert on one of the data

5   samples. Apple therefore has no explanation for how these data samples can be considered

6   "cherry-picked," given Dr. Jafari could not have selected them simply because he believed they

7   would support the "conclusion [he] wanted to reach." *See Rearden*, 2021 WL 6882227, at *7.

8   In nonetheless seeking to exclude Dr. Jafari's well-founded opinion, Apple again

9   misrepresents Dr. Jafari's testimony. According to Apple, Dr. Jafari "unabashedly admit[ted]

10   Mr. Valys told him these two samples would provide the ████████████' results to support

11   AliveCor's position in this litigation." Jafari Mot. at 10. But that cited testimony refers to Dr. Jafari's

12   review of Mr. Valys's *deposition transcript*, and Dr. Jafari explained at deposition that ████████

13   referred to whether the sample triggered a SmartRhythm alert, *and* whether one ████████████

14   ██

15   ████████ Dkt. 222-55 at 95:13-23. Identifying examples that help test a hypothesis in the clearest

16   way possible is not a methodological flaw.

17   Apple's cited authorities (Jafari Mot. at 10) do not compel a contrary conclusion. In *Rearden*,

18   the expert "candidly acknowledged" that she omitted certain data points because she thought it

19   would undermine her conclusions. 2021 WL 6882227, at *7. Here, by contrast, there is no evidence

20   that Dr. Jafari excluded any data samples because he believed they would not support his hypothesis

21   that watchOS 5 degraded SmartRhythm. If Apple had such evidence, it would presumably show the

22   Court at least some. It has not, because watchOS 5 broke SmartRhythm. *Cf.* Mot. § II.C (collecting

23   evidence Apple knew it could, and then did, break competing HRA apps). For the same reasons,

24   Apple's other authorities do not compel exclusion. *See In re Bextra & Celebrex Mktg. Sales Pracs.*

25   *& Prod. Liab. Litig.*, 524 F. Supp. 2d 1166, 1176-78 (N.D. Cal. 2007) (expert's conclusion ran

26   counter to a wealth of epidemiologic evidence); *In re Countrywide Fin. Corp. Mortgage-Backed*

27   *Secs. Litig.*, 984 F. Supp. 2d 1021, 1039-40 (C.D. Cal. 2013) (expert's data sample relied

28   predominantly on data used in bringing the suit, and therefore suffered from selection bias).

████████████

       (b)   *Apple's "non-representative data" arguments once again*
                           fundamentally misunderstand Dr. Jafari's experiments

Apple's "non-representative data" arguments also fail. Apple claims, based on an unsupported opinion from Dr. Stultz, that one of the data samples Dr. Jafari analyzed "appears to be an unusual and likely non-representative sample" of the SmartRhythm user base because the patient from whom the data was collected potentially had both an atrial flutter and Afib. Jafari Mot. at 8. Dr. Stultz, however, does not explain why this matters, since he concedes the patient had Afib. Dkt. 222-5 ¶¶ 115, 120. Moreover, SmartRhythm identified the patient's Afib on watchOS 4, but *not* on watchOS 5—the core technical problem in this case. Thus, while Dr. Stultz may make this contention, his view that the second patient had atrial flutter *in addition* to Afib is confusingly irrelevant and at best goes to the weight of Dr. Jafari's opinion. *City of Pomona*, 750 F.3d at 1049.

More broadly, Apple does not provide any reason to believe the samples Dr. Jafari analyzed are non-representative of *watchOS HRA app users*. Apple only cites Dr. Stultz's opinion that the second patient Dr. Jafari analyzed "is likely very different from the majority of patients in the real world who would normally wear an Apple Watch." Dkt. 222-5 ¶ 124. However, Apple does not cite any evidence for this point, and the record in fact shows that SmartRhythm and other HRA app users are typically older and at higher risk of multiple serious heart conditions than the average Apple Watch user. *See, e.g.*, Dkt. 193-36 at 49:5-50:5, 134:9-135:14.

In addition, Dr. Jafari explained that the first data sample presented with an ████ ████████ *i.e.*, elevated heart rate. Dkt. 222-55 at 87:11-16. In contrast, the second sample presented as Afib without an elevated heart rate, and therefore only ████████████████ *Id.* at 87:19-22. Testing data from these different manifestations of Afib had the advantage of being ██ ████████████████ with the data selected. *Id.* at 86:14-87:9. Thus, if anything, the samples Dr. Jafari tested were likely ***over*-representative** of AliveCor's broader user base.[6]

_____

[6] For these reasons, Apple's Ford F-150 and Porsche 911 analogy (*see* Jafari Mot. at 9) is nonsensical. SmartRhythm is about signal detection; it analyzes heart rate data that comes in, then detects and alerts its user to an irregular heart rhythm. Dr. Jafari selected two examples of heart rate data that he *knew* exhibited irregular heart rhythms and then tested his hypothesis regarding if (and, if so, how) SmartRhythm's ability to identify those irregularities changed between watchOS 4 and (footnote continued)

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

███████████████████

B.   Dr. Jafari's Citation To AliveCor's Business Records And Employee Testimony Is Entirely Proper

Apple next contends that Dr. Jafari improperly relied on "several documents reflecting analyses and opinions of AliveCor engineer Mr. Valys and fact testimony from additional AliveCor personnel," and should have conducted an "independent analysis" of Mr. Valys's 2018 memorandum. Jafari Mot. at 11. Neither criticism holds water. In addition to conducting his own independent analysis of Mr. Valys's memorandum, Dr. Jafari compared the results of his experiments and his understanding of Apple's source code to the testimony and documents from AliveCor's employees, explaining *why* AliveCor employees observed what they did.

1.   Dr. Jafari does not "regurgitate" Mr. Valys' 2018 memorandum; he used it as an experiment design model *and* tested its inputs

Dr. Jafari did not, as Apple claims (Jafari Mot. at 11-12), merely regurgitate Mr. Valys's 2018 memorandum. First, as previously noted, he used the memorandum as a model for how to design his SmartRhythm-focused experiments. Dkt. 193-44 ¶¶ 61-66. This is completely valid and demonstrates good science, because replicating Mr. Valys's experimental method (which Dr. Jafari was able to do in full) allowed him to directly compare results measured on the █████████ ██████████████████████████. *Id.* ¶¶ 70-80. By ██████████████████████████ in this way, Dr. Jafari was able to *compare* his experiment results with Mr. Valys's to see whether AliveCor is correct in its allegations that watchOS 5 broke SmartRhythm. *Id.* ¶¶ 81-90. Apple's complaints that Dr. Jafari did not review the ██████████████████████████ ███████████, or that he was not able to replicate Mr. Valys's exact results thus miss the entire point and, in any event, at most raises issues for cross-examination, especially since Apple did not do those things itself. *Cf. Restoration of the Env't*, 80 F. Supp. 3d at 1225.

But, Apple is also simply wrong. Dr. Jafari *did* independently analyze the 2018 memorandum's findings. The memorandum itself clearly shows ████████████████████████ ██

---

watchOS 5. In contrast, Apple's strained analogy assumes there was no explained reason for the different experiment variable choices, and it posits an experimental approach completely different than what Dr. Jafari employed. It therefore requires little response beyond that observation.

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

█████████████

1   ██ 222-54 at '919-21. This

2   allowed Dr. Jafari to make several findings by reviewing the memorandum's objective data. *See*

3   Dkt. 193-44 ¶¶ 75-80. Furthermore, because one purpose of his experiments was to recreate the test

4   conditions that ██████████████████████, *see* Dkt. 222-55 at 30:22-31:22, Dr. Jafari was able

5   to confirm that using a WhaleTeq simulator ████████████ produced accurate heart rate

6   readings, which he confirmed in a ████████████████████████████████. *Id*.

7   at 22:15-20. There is thus no indication that Dr. Jafari merely parrots Mr. Valys's 2018 findings. To

8   the contrary, Dr. Jafari *tested* those findings and███████████████████████████████

9   ████████████████████████████. That shows Mr. Valys's experiments are

10 reproducible—one of the hallmarks of valid scientific experiments. *See City of Pomona*, 750 F.3d

11 at 1046 ("The test under *Daubert* is whether the method 'can be or has been tested.'").

12   Apple's cited authorities do not compel exclusion of Dr. Jafari's opinion either. In *Malletier*

13 *v. Dooney & Bourke, Inc.*, 525 F. Supp. 2d 558 (S.D.N.Y. 2007) (cited Jafari Mot. at 11), a testifying

14 expert relied on a regression analysis conducted by a different economist that he did not review or

15 validate himself. *Id*. at 650-51. While the analyst who conducted the regression analysis was

16 "probably qualified" to conduct that regression, the *challenged* expert "was demonstrably

17 unqualified" to offer regression model-based opinions, made worse because that regression was the

18 "only basis" for the testifying expert's opinion. *Id*. at 664-66. Here, by contrast, Dr. Jafari is

19 indisputably qualified to offer the technical opinions he provides. And, unlike in *Malletier*, Dr. Jafari

20 conducted his own source code analysis and experiments, and included Mr. Valys's memo as just

21 one more piece of evidence supporting his opinions about watchOS 5 and SmartRhythm—

22 especially because he tested that memorandum's objective reliability himself. Dkt. 193-44 at

23 ¶¶ 81-90. *Malletier* shows by contrast why Dr. Jafari offers strongly admissible opinions here.

24   Nor does *PODS Enters., Inc. v. U-Haul Int'l, Inc.*, 2014 WL 12628662 (M.D. Fla. July 2,

25 2014) support excluding Dr. Jafari's opinion. In *PODS*, the court found "mostly unpersuasive"

26 U-Haul's argument that an expert should be barred from opining on the "fame" of a trademark. *Id*.

27 at *2. The court nevertheless found the expert's references to another expert's surveys inadmissible

28 because they parroted the other expert's findings and opinions, rendering them cumulative. *Id*. Here,

-13-

██████████████

1   by contrast, Dr. Jafari does not parrot the findings in Mr. Valys's memorandum, but *tests* them and

2   *uses* them as a comparison for his own experiments ████████████████████████████████████ [7]

3   Again, these are the hallmarks of good science.

4   Apple next contends that Mr. Valys's memorandum "cannot stand on its own" for lack of

5   reliability. Jafari Mot. at 12. As an initial matter, Apple's point is irrelevant to this motion, which

6   seeks to exclude certain opinions of Dr. Jafari, not any testimony given or documents created by

7   Mr. Valys. Further, Apple does not dispute that the memorandum is a business record Mr. Valys

8   prepared for AliveCor's CEO or that such memoranda are typically admissible. Nor does Apple

9   explain why *In re Incretin-Based Therapies Prods. Liab. Litig.*, 524 F. Supp. 3d 1007 (S.D. Cal.

10   2021), has any bearing on this issue, because Mr. Valys is not testifying as an expert and there is no

11   evidence that he prepared the memorandum for this litigation. *Id*. at 1039-40 (excluding an *expert*).

12   In any event, even if the memorandum is not admissible, Dr. Jafari is permitted to rely on it to form

13   his opinion. *See Peralta v. Worthington Indus. Inc.*, 2022 WL 112224, at *4 (D. Ariz. Jan. 12, 2022)

14   (permitting expert to rely on conversation with defendant's former engineer where the expert was

15   familiar with the engineer's typical methods).

16   Apple also argues that Dr. Jafari's reliance on the Valys memorandum is "inappropriate"

17   because that memorandum ██

18   ██   Jafari Mot. at 12. But, as discussed above, Apple ignores that the main bases for Dr. Jafari's

19   opinions were his extensive source code review and his experiments, Dkt. 193-44 at ¶¶ 81-90, and

20   that his experiments were a *comparison* to the 2018 tests. Apple's reliance on *Gen. Electric Co. v.*

21   *Joiner*, 522 U.S. 136 (1997), is thus misplaced, because it identifies no "analytical gap between the

22   data and the opinion proffered" at all, let alone one that is "too great." *See id*. at 146.

23

24   [7]   Apple further relies on *In re Sulfuric Acid Antitrust Litig.*, 235 F.R.D. 646 (N.D. Ill. 2006),
for the proposition that "one expert could not be the mouthpiece for another." Jafari Mot. at 12. But

25   the court there *permitted* expert testimony that relied on materials created by an unproduced expert,
and distinguished cases in which an expert was acting as a mouthpiece for another expert. *Sulfuric*

26   *Acid*, 235 F.R.D. at 657 ("The only way *Loeffel Steel II* or *Dura Automotive* would apply here is if

27   Boyd had instructed Dr. McClave on what to do with the underlying price data, and Dr. McClave
followed those instructions without understanding them or bringing any independent expertise to

28   bear. But that is not what occurred."). Dr. Jafari similarly brought his experience to bear in this case.

██████████████

2.   Apple provides no reason why Dr. Jafari's reliance on AliveCor testimony and business records is unreliable

Finally, Apple takes issue with Dr. Jafari's reliance on certain documents and testimony from AliveCor employees, claiming he needed to conduct an "independent analysis" of each. Jafari Mot. at 13. As an initial matter, this is wrong because Dr. Jafari *did* conduct an independent analysis through his source code review and Watch sample experiments. *See supra* § IV.A.

The broader problem for Apple is that it simply raises a weight argument. It identifies no reason why the AliveCor materials Dr. Jafari cites are not of the type on which a technical expert would rely, given they come from technical employees performing technical analyses as part of their technical jobs. Moreover, Apple cites Dr. Stultz's opinion that an observed decrease in SmartRhythm alerts does not necessarily mean that watchOS 5 caused that degradation. Jafari Mot. at 13. But that is simply Apple's expert's speculation, which goes to the weight, not admissibility, of Dr. Jafari's opinions. *iPod iTunes*, 2014 WL 4809288, at *5 (finding that none of Apple's objections "establish such a level of unreliability or unhelpfulness" but rather "go to the weight of [expert's] opinions."). And, while Dr. Jafari did not analyze the data underlying the AliveCor documents and extensive testimony he cites, his opinion does not *rely* on that evidence, but tests (and explains) *why* AliveCor would have seen those objective results.

Finally, in arguing that Dr. Jafari failed to perform any independent analysis regarding Mr. Valys's observations about ████████████████████████████████, Apple is simply incorrect. Appendix A of Dr. Jafari's opening report shows his analysis of that exact issue. Dkt. 193-44, Appx. A ¶ 23. Based on that analysis, Dr. Jafari explained how the change "would impact algorithms that rely on heart rate values and their corresponding time stamps." *Id*. Thus, not only did Dr. Jafari objectively corroborate Mr. Valys's testimony; he explained what happened behind the scenes (in proprietary source code) to cause what Mr. Valys observed.

V.   CONCLUSION

For the foregoing reasons, the Court should deny Apple's motion to exclude Dr. Jafari's opinion that watchOS 5 degraded the functionality of SmartRhythm.

-15-

1   DATED: August 24, 2023   QUINN EMANUEL URQUHART & SULLIVAN,
                                           LLP
2

3
                                           By   /s/ Adam Wolfson
4   Sean Pak
                                               Adam B. Wolfson
5   Andrew M. Holmes

6   *Attorneys for Plaintiff AliveCor, Inc.*

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

PLAINTIFF ALIVECOR, INC.'S OPPOSITION TO APPLE'S MOTION TO EXCLUDE
THE TESTIMONY OF DR. ROOZBEH JAFARI

1

CERTIFICATE OF SERVICE

2

I, Adam Wolfson, hereby certify that on August 24, 2023, the foregoing **PLAINTIFF**

3

ALIVECOR INC.'S OPPOSITION TO DEFENDANT APPLE INC.'S *DAUBERT* MOTION

4

TO EXCLUDE THE TESTIMONY DR. ROOZBEH JAFARI was filed with the Clerk of the

5

Court via CM/ECF. Notice of this filing will be sent electronically to all registered parties by

6

operation of the Court's electronic filing systems.

7

8

9

DATED: August 24, 2023

10

11

By /s/ *Adam B. Wolfson*
      Adam B. Wolfson

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28